

**Presented by  
UCLA Extension Public Policy Program  
In collaboration with  
University of California Transportation Center**

**Sponsored by  
California Department of Transportation  
Transportation System Information Program**

**IMPLEMENTING  
PERFORMANCE MEASURES  
For  
Transportation System Users and  
Investors in California**

**Thursday and Friday, April 22-23, 1999  
Sacramento Convention Center, Sacramento, CA**

# **IMPLEMENTING PERFORMANCE MEASURES FOR TRANSPORTATION SYSTEM USERS AND INVESTORS IN CALIFORNIA**

Summary of a two-day conference held on  
April 22 and 23, 1999 in Sacramento, California

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**This report was prepared as part of a project sponsored by the California Department of Transportation, Transportation System Information Program, with funding from the Federal Highway Administration. The views expressed herein are those of the conference speakers and participants as summarized by the author of this summary report. The views reported in this summary may not necessarily represent the views of the State of California or the Federal Highway Administration.**

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## **Introduction**

On April 22 and 23, 1999 the UCLA Public Policy Extension Program and the University of California Transportation Center presented a conference entitled *Implementing Performance Measures for Transportation Systems Users and Investors in California*. The event, held at the Sacramento Convention Center, was sponsored by the California Department of Transportation and attended by federal, state and local government officials, as well as by researchers, consultants and representatives of private interests.

Caltrans incoming Director, Jose Medina opened the conference by noting that transportation issues have surpassed even crime at the forefront of public concern. This heightens the need to effectively communicate to the public and to decision-makers the expected and actual performance of transportation investments. The new administration in Sacramento has enthusiastically endorsed the ongoing movement to implement performance measures.

The purpose of this conference was to explore issues related to implementation of performance measures as part of California's transportation planning, management, allocation and policy-making process. Having concentrated in a previous conference in October 1997, on developing a set of performance measures, the task at hand was to work out the details of getting these measures in place. It has been widely recognized that implementation will be the hardest part of instituting performance measures.

This summary presents highlights from the proceedings of the conference. First, background concerning Caltrans' work on performance measures is provided. The goals for the conference are then discussed. Next, a survey of current practice outside California is presented. This section summarizes presentations made by speakers working at the federal, state and regional levels and is followed by a review of experience with performance measures in California. A discussion of the major themes of the conference and a separate section devoted to challenges to implementation are rounded off by contemplation over what the immediate future holds for Performance Measures.

## **Background**

The October 1997 performance measures conference provided an understanding of what performance measures are and how they can be used. Performance measures have become salient in particular for their roles in program and system performance evaluation, system planning, budget prioritization, and public accountability. Application to the transportation field gained widespread interest as an essential way of monitoring and projecting outcomes related to policies and investments, and as a way of monitoring organizational accountability and responsiveness.

Caltrans, through a process of consultation and collaboration, has identified nine performance measures for use throughout the state in accordance with legislative requirements:

- Mobility/Accessibility
- Reliability
- Cost Effectiveness
- Sustainability
- Environmental Quality
- Safety/Security
- Equity
- Customer Satisfaction
- Economic Well Being

At the 1997 conference, Caltrans affirmed its commitment to striving for a customer focus in applying performance measures. It selected these measures in order to be outcome oriented rather than output oriented. Caltrans also is encouraging consistency in the use of these measures for all transportation systems in the state and not just those directly under Caltrans jurisdiction. Local and regional needs will determine the choice of measures and which ones will be emphasized.

This initial work has been formalized in the recently completed State Transportation Plan. Meanwhile the application of performance measures has continued to find acceptance among transportation professionals in a variety of settings throughout the nation. It is worth noting that by developing a policy for performance measures, Caltrans' work developing performance measures has brought the state to a position of relative prominence nationally.

The drive toward performance measurement is further fueled by ongoing implementation of Senate Bill 45 (SB 45) in California, which requires consideration of objective performance criteria, and by the Transportation Equity Act for the 21st Century (TEA 21) at the federal level, which ties federal funding to devolution of project programming responsibilities. More than one speaker observed that there is no turning back now.

### **Goals of this conference**

With a working concept in place and nine outcome measures selected, the purpose of this conference was to draw from many experiences and ideas relating to implementation. Although some time was inevitably devoted to reviewing the needs and expectations for performance measures themselves, most sessions were devoted to exploring the state of the art and the technical and political challenges involved in putting these measures into place.

Cynthia Burbank, representing the Federal Highway Administration, spoke about the need to disseminate models of best practice in order to meet National goals for the implementation of performance based programs as laid out in the recent TEA 21. Her points were augmented by a series of speakers and case studies from inside and outside California, demonstrating some of the do's and don'ts of implementation. Although some generalizations were apparent, notably that efforts at implementation should strive for relevance without encumbering efficient operations, a consensus also arose that any implementation efforts are bound to be highly sensitive to context and that one size does not necessarily fit all.

Among the technical issues were concerns that data requirements accompanying the implementation of performance measures would be difficult. Various speakers addressed this issue directly and Caltrans assured attendees of their commitment to maximizing the use of existing data sources instead of creating the need for new ones.

The main political challenge involves obtaining "buy-in" both inside and outside transportation agencies. Internal buy-in has at least two significant dimensions. On the one hand, it is important to recognize that resistance to change is a normal characteristic of organizations and that it demands specific attention. On the other hand, as Harold Kassoff of the consulting firm Parsons, Brinkerhoff, Quade, and Douglas pointed out, it must also be clear that the spirit of the movement toward performance measures is as important as the letter of the law. The frequently reiterated point that the focus should be on outcomes and not outputs supports this. Externally much of the same reasoning applies and the emphasis was placed on discussing how to supply decision-makers with appropriate tools for shaping policy and offering the public a means to ensure accountability.

### **State of Current Practice**

The conference provided a platform for airing experiences implementing performance measures in federal, state, and regional contexts. Harold Kassoff set the tone for the conference by pointing to a profound change in governance in the United States, one that is marked by efforts to accommodate irreversible demands for responsiveness and accountability. Performance measures fit in by ensuring such accountability and indicating to constituents, as consumers, that they are getting their money's worth.

The National Cooperative Highway Research Program has sponsored a report on performance measures that should serve as a guide to the state of the practice. In discussing his work on this report, Steve Pickrell of Cambridge Systematics emphasized several common observations from a review of 10 case studies and over 500 performance measures. Key among these was emphasis on the *process* of implementing and using performance measures and not entirely on the specific measures themselves. Also, it was found that performance measures worked best as part of flexible guidance and not when used to apply strict directives.

## *Federal Experience*

Cynthia Burbank discussed how new federal funding authorized in TEA 21 comes with strings attached particularly in terms of accountability. Although states and Metropolitan Planning Organizations (MPOs) will be selecting the projects to which some \$25 billion in federal money will be allocated, agencies like the Federal Highway Administration (FHWA) still have to answer for how well these dollars are being spent. Initial work in this direction engendered deep concerns on the part of some states. It has been observed that the use of federal performance measures could be seen as foreshadowing imposition of top-down mandates. Furthermore, by evaluating the performance of investments in different states, fears have been raised that the measures could be used to make comparisons between states. Finally the inevitable issue arose of potential expansion of data collection requirements without increasing resources available for data gathering.

Concerns over these pitfalls would resonate throughout the conference, so Ms. Burbank's description of FHWA's response was well directed. To clarify their overall intent, FHWA would adopt a set of guiding principles. Among other things, these established that there is a federal statutory obligation to track the results of programs financed with federal funding. At the same time, federal involvement would not include any direct control over the setting of goals for particular programs. Rather, energy would be devoted to improving the way that programs are carried out, particularly by performing research into existing regulations and by offering advice. Ms. Burbank noted that since adopting and communicating these principles much of the initial opposition from the states has died down.

Performance measures are also pertinent at the federal level, given FHWA's mandate to adopt its own performance-based strategic plan in conformance with the Governmental Performance and Results Act of 1993. The product of this mandate is FHWA's 1999 Performance Plan. With the goal of streamlining performance, the plan was based on the adoption of specific strategic goals and the identification of performance measures associated with each goal.

## **State and Regional Experiences Outside California**

James Etymanczyk spoke about the Wisconsin Department of Transportation's (WisDOT) Performance Strategy, in which emphases have been placed, on maintaining quality in the workforce, promoting safety, strengthening partnerships with the business community, and anticipating and satisfying customer needs. In WisDOT's performance strategy the performance measures are integrated into an overarching management system designed to bring about a fundamental organizational change toward customer focus. The measures have facilitated the move of executive level decision makers away from questions about how to do things, allowing them to focus more properly on why to do things. The measures have been used to establish targets, and while managers hold tight to the targets they are able to be flexible over the methods by which they are reached.

Mr. Etymanczyk advised the audience that entrenched ways of doing things would be hard to change and that employees need to be brought along in the process of changing management style. The keys to doing so lie in getting staff to agree with the overall purpose (the "why"), to understand precisely the changes that are being made (the "what"), and to have a role in figuring out methods (the "how").

Mr. Etymanczyk emphasized the importance of not reinventing wheels but taking advantage from previous research and experiences of other states. Successful strategies should be freely borrowed and applied by agencies similar to those in which they were innovated.

Because the experience in Minnesota implementing performance indicators had been so well received at the 1997 conference, this conference also featured an update on progress at the Minnesota Department of Transportation (Mn/DOT). For the 1999 conference Mn/DOT was represented by Randall Halvorsen. The Minnesota experience has gained attention because of the breadth of measures that have been integrated into a hierarchy. This family of measures drives internal management and system planning and monitoring, and provides a basis for evaluating customer satisfaction.

Mn/DOT has demonstrated that the challenge of implementing a complex set of measures can be overcome if senior members of the organization are involved in designing the measures and if all functional divisions of the organization "proceed in lock-step." But other barriers remain. For example, fears of unfair comparisons based on performance measurements have arisen within Mn/DOT. Furthermore, experience has proven wrong the assumption that once key players were involved in designing the measures and staff was involved in collecting the data, application and use of the measures would be self-evident. Mr. Halvorsen pointed out that in addition to taking the time for a more rigorous look at the measures themselves, more energy will be spent reaffirming the overall goals of performance measures and this will include more support to show staff within each division how to use them.

John Poorman also made a return visit for the 1999 Conference; he once again represented the Capital District Transportation Commission, a metropolitan planning organization (MPO) in the Albany, New York area. The Capital District has continued to have success with the use of both core (public values specific) performance measures and supplemental (system specific) measures as discussed in the 1997 conference. In at least one case, performance measures have illuminated an imbalance in funding priorities that decision-makers were able to rectify. Elsewhere, data revealed by performance measurement provided justification for implementing system specific demonstration projects, most notably a project to establish commuter rail service.

Among the challenges confronted in Albany, Mr. Poorman cited the need to be sensitive to demands on staff time imposed by performance measures among monitoring, implementing and advancing organizational objectives. Another lesson



was the need to be comprehensive when working across systems, if only to strive toward achieving a level playing field in decision making. Also cited were the importance of not forcing quantification and not obsessing about detail.

Case studies on the application of performance measures to funding allocation were presented by consultant Deborah Matherly based on her work in Indiana, and Brian D. Taylor, of the University of California, Los Angeles, who looked at experiences in 16 states. Both speakers dealt directly with the use of performance measures in the determination of funding allocations for transit service providers.

In Indiana, the political climate drove the use of peer comparisons as a basis for the allocation of funding as early as 1985. Starting with amendments to this formula established in 1989, the experience in Indiana has been characterized by many successive adjustments in order to base some portion of each system's allocation on performance. This culminated in a completely revised formula implemented in 1997. Key features of this formula included redefining groups of systems based on comparable characteristics and balancing measures to emphasize factors that favor different groups in different ways. One important lesson from the experience was that the need for simplicity was often set aside in order to achieve fairness and to allow flexibility in addressing specific agency concerns. The "buy-in" of the participants into the system was not a function of prior decisions in developing the measures, but rather the hand that they had in protecting their stake in the process.

Brian Taylor identified a number of constraints on performance based subsidies in his analysis of transit subsidy programs in sixteen states. To begin with, there is a concern that users of systems with poor performance would end up being punished in the long run by receiving proportionately less funding. In order to maintain distributional equity the performance-based portion of funding is often reduced to a small percentage of the overall allocation received by any given system. Mr. Taylor identified an underlying conflict between the goal of providing an equitable geographic distribution of service and the goal of basing funding on system performance.

A related theme raised in Mr. Taylor's presentation was the need to consider not only the performance of the systems but also the performance of the (performance based) finance program itself. A move toward basing funding on performance measures can not be construed as a threat to funding or else the move will fail. Mr. Taylor cited one official who put it bluntly "I'm in favor of anything that results in an increase in my funding allocation; I'm opposed to anything that's going to decrease it."

## **Experiences in California**

Allan Hendrix, Caltrans' Deputy Director for Planning, spoke on progress made implementing performance measures since the passage of SB 45 two years ago and the completion of the State Transportation Plan. The objective has been to establish outcomes based measures for all transportation systems in California and not just State Highways and other transportation systems operated by Caltrans. This is driven by two

main goals: 1) to develop indicators that assess the performance of each system and support informed decisions; and 2) to establish coordinated and cooperative processes for consistent performance measurement in California.

The emphasis on consistent measurements is particularly noteworthy. The State has borrowed liberally from the previous efforts of two large metropolitan transportation planning organizations (MPOs) in California, the Metropolitan Transportation Commission of the San Francisco Bay Area and the Southern California Association of Governments (SCAG), in the Los Angeles area.

From the list of nine measures selected statewide, three are the focus of pretest and initial implementation: Mobility/Accessibility, Reliability and Safety/Security. The design of indicators to measure outcomes in these areas has been accepted as an incremental process in which Caltrans has committed to building partnerships internally and externally to see that it is carried through.

Tarek Hatata of Booz, Allen and Hamilton, a consulting firm assisting Caltrans, discussed his work on the pretest in the SCAG region of transportation performance measures for the State. One important goal of the pretest has been to show how indicators can be developed to evaluate performance on highway and transit systems using existing data.

For example, Mr. Hatata discussed how travel time was used as an indicator of mobility and of reliability when variation is taken into consideration. Nevertheless, it has been conceded that it is not currently feasible to get door-to-door travel time data for either mode at the state or regional level. The use of highway loop-detector data and transit schedule information does support performance measurement applications and allow for comparisons. Reliability can be evaluated by comparisons between recurrent and proportional non-recurrent highway delay on the one hand and normalized measures of transit system on-time performance on the other hand.

It is recognized that tough assignments lie ahead. For some of the proposed measures, for example economic well being, the tools simply do not exist to do adequate modeling, and adapting tools designed to do forecasting to the task does not seem appropriate. Furthermore, even in areas where tools do exist, gaps in the data are common and there are differences in data gathering capability throughout the State in terms of the areas covered by existing data collection programs. It is fortunate that the coverage tends to be best where the congestion is worst but the obstacles facing rural jurisdiction were recognized as significant.

## **Recurring Themes**

As the proceedings moved through presentations, panel discussions, question periods, and workshops several key points were frequently mentioned. Implementation was clearly seen to be the hard part in contrast to designing performance measures. Several other topics provided the basis for broad agreement.

## *User Emphasis*

From the Federal level through the various states and in multiple regional contexts, one of the central factors behind the adoption and successful implementation of performance measures has been the desire to improve system and organizational responsiveness to the users or customers. This explains the consistent emphasis on outcomes versus outputs as well as the desire to see performance measures as part of an overall process and not an end in themselves.

The matter of how to define users becomes an important one. This is clearly multifaceted. Certainly system users themselves are considered, and in the first pass it is they who are expected to benefit from the adjustments and improvements that result from monitoring and forecasting system and organizational performance. Politicians must be considered users of performance measures because it is in the political process that claims about current or future performance are translated into political support or public investment.

Non-users of the system must be considered as well. In the first place, the costs of transportation systems - particularly the externalities - are not confined to system users. Furthermore as declared by Harold Kassoff in his opening remarks, all constituencies have expressed a growing interest in government efficiency and responsiveness, regardless of whether they make use of a particular public service. Given a need to focus on public values, the environment was even proposed as a "customer."

Certainly, public agencies themselves must be considered in their roles as users of performance measures if not as system users per se, particularly when considering how relationships evolve among jurisdictions and between different levels of government.

## *Obtaining "Buy-In"*

All participants recognized the essential requirement that both end users and staff would have to embrace the whole concept of performance measures and then the use of particular indicators. A sense of realism predominated with respect to this issue, with most speakers cognizant of the multiple barriers to getting this "buy-in."

Internally to each organization it has been recognized that a prior order would predate the implementation of performance measures in every situation. Inevitably some staff members will have a stake in the way things work now and it is necessary to make strides in winning their support by various means. Some resistance may have a solid basis, particularly where staff is confronted by mutually incompatible mandates or excessive claims on time and resources.

"Buy-in" from users can not be assumed as a natural result of a customer focus. The credibility of information generated by performance measures would directly relate to such buy-in, as would its actual usefulness in facilitating customer choices. The prospect of collecting data that no one would use arose on more than one occasion.

Fortunately examples have been offered where buy-in has been achieved. Furthermore California can take heart from the recent experience in Minnesota, where the use of performance measures has survived the change in direction associated with the inauguration of a new Governor with a different philosophy towards government.

### *System and Organizational Goals*

Performance measures can be expected to work best when they reflect clear goals for individual systems and for the organizations that manage and coordinate those systems. Where such goals cannot be agreed on, the ultimate impact of performance measures is not certain, but their use may be in actually locating the most reasonable goals.

Therese McMillan of the Metropolitan Transportation Commission spoke about the many goals expressed for transit systems in the San Francisco Bay Area. On one hand there is a push to attract discretionary riders to improve air quality. Also, there is a desire to attract suburban riders to combat urban sprawl. Meanwhile the mandate to serve those without access to cars persists on equity grounds. As a result, transit operators are left with demands to serve all markets with little regard to the costs involved. How to apply performance measures in this circumstance is not clear, but one role for performance measures may be in communicating the costs associated with such tangled values and supporting a political process that unravels them.

### *Feedback and Flexibility*

The degree to which Caltrans can maintain flexibility will determine its success with implementation. The lesson that "one size does not fit all" was taken very seriously by all participants. The desire to use a consistent set of measures throughout the state might seem to contradict this on the surface. In fact, according to Allan Hendrix and other Caltrans representatives this desire forces the state to be flexible in what indicators they can expect when various jurisdictions apply any one of the nine performance measures. While Caltrans does expect local and regional jurisdictions to try to work with the measures that have been selected, flexibility would result in individual jurisdictions deriving their own measures to suit their own needs. In the same light, Caltrans acknowledges the need to prevent measures from leading to unfair comparisons between dissimilar contexts. Working collaboratively across jurisdictions and user groups is emphasized in the process being employed in California.

A related factor driving interest in flexibility is the need to build up data capability from a variety of existing sources. Following the federal lead, if the state sees a genuine need to require that certain data be collected uniformly to establish a given indicator, there is understanding that such a requirement should be tied to sufficient resources.

Feedback is important in maintaining the flexibility of the process as a whole. Feedback from jurisdictions can be encouraged by building partnerships and giving them a clear stake in design and implementation. Caltrans has begun to develop a track record through its continuous improvement process. Externally, feedback must be actively sought through focus groups and surveys. Finally, there is great anticipation over the ways that technology can be used to generate feedback, particularly through the use of real time data generated by Transportation Management Centers.

## **Challenges to Implementation**

Just as understanding was attained regarding the implementation of performance measures, participants also concurred over several of the challenges that lie ahead.

### *Data Requirements*

Despite Caltrans' general commitment to working with existing data sources, concern over burdensome data requirements is acute. There is an expectation that at some time new data collection will be needed to fully implement desired performance measures. Some participants went so far as to suggest that Caltrans should consciously place limits from the start on new requirements for data collection. Others cautiously noted that there may be performance measures that should be measured that are not, and there is also likely to be some data collection that is redundant and some data that aren't used. Eliminating collection of these would free up resources to devote to other areas.

On the other hand, rural jurisdictions in particular are confronted by the reality that there is no slack in existing data collection capabilities. This overriding constraint heightens fears over the basis for comparisons, particularly when programming investments as discussed in the next section.

### *Integration with Programming Requirements*

Two dimensions of the project programming process have raised concerns in light of SB 45. Now that the roles of local and regional agencies have been expanded in guiding the programming process, there is a question as to how best to allocate staff time. It was recognized that the same staff who would be responsible for ongoing performance measure monitoring and forecasting would in most cases be responsible for devoting the months of time necessary to adequately prepare the Transportation Improvement Program (State-TIP, STIP or Regional-TIP, RTIP) submittals. More attention needs to be paid to refining how both system and organizational performance measurement can be integrated into the programming process.

The increased control that rural jurisdictions are gaining in determining their own investments may exacerbate their data collection problems. As Phil Dow, of the Mendocino and Lake County Council of Governments, explained there is language in SB 45 and in the evolving RTIP guidelines that relate to meeting effectiveness criteria to justify funding. In rural counties staff recognize that they can rely on Caltrans to

some extent to measure and determine satisfaction of such criteria on state facilities. However, many of the areas that will need investment are under county and local jurisdiction. Additionally, there is no clear assurance that rural counties will be able to apply for funding on the same basis as metropolitan areas.

With this in mind, Caltrans must live up to its commitment to strive for consistency in measures rather than conformity. It is encouraging that Caltrans has taken the stand that, in Allan Hendrix's words, rural growth issues are Caltrans' issues.

### *Innovation*

Attention must be paid to ensuring that performance measures facilitate innovation and do not stifle it. Given the nine measures that Caltrans has selected, a question arose as to how useful performance measures would be when applied to the specific performance of an innovation having operating characteristics that may not fit neatly with any pre-existing indicators. If the legislature were eventually to base funding on performance as measured by a fixed set of indicators, innovative projects would be put at an immediate disadvantage.

In such a case, it was observed that the burden falls on the innovating agency to properly determine which of the nine fundamental measures the innovation is geared to address and to develop indicators that adequately show the relationships that justify such innovations. It was suggested that some indicators may be more amenable to less rigid applications than others. Some jurisdictions may find creative ways to orient programs toward addressing economic well being, for example.

### *Using Forecasting*

The use of performance measures in forecasting raises several concerns. On the one hand, there are technical issues related to the use of forecasting models. Models are abstractions of reality even when outputs consist of the same indicators as performance measurements. Models themselves are not substitutes for empirical data. The accuracy of model output should be of constant concern. Studies may be appropriate after policies are implemented to verify that information coming from models is reliable, but at the same time models should mainly be relied on to understand the direction of change.

Given projections for growth in many parts of the state, forecasts should support changing policy discussions from how to avoid impacts to designing appropriate programs. The fear was raised however that given current political realities, the disturbing information about growth and development may simply be set aside without ever being incorporated into public policy debates.

Some agreement was reached that the use of performance measures might be best integrated with monitoring applications first. After this is accomplished some answers about how to combine performance measures with forecasting may be more evident.

### *Integration with Land Use Decisions*

A further conundrum affecting the ultimate success of performance measures is whether or not they will be able to facilitate the coordination of land use with transportation policies. Experience has shown that when any form of regulation is passed down to lower levels of government with the aim of constraining land use decisions it is often rejected in the face of considerable local resistance. Local control over land use policy is a strong public value and restrictions on that control are very unpopular.

The dilemma however is that in some way all of the measures that have been selected by Caltrans are affected by patterns of land use. If land use is not considered this may reduce the validity of the measures themselves. The better course appears to be for organizations to work hard to get good data on land use and to develop performance measures in such a way that they are responsive to variations in land use over time and from place to place.

### **Next Steps**

Implementation efforts are ongoing and will continue. Caltrans will expand its testing of measures from the three initial measures of Mobility/Accessibility, Reliability, and Safety/Security to reflect more of the ultimate set of nine measures over time. Meanwhile, local and regional jurisdictions are obliged to advance their own performance measurement efforts as consistent with the State Transportation plan, as well as SB 45 and forthcoming state programming and planning guidelines.

Ironically, a dip in the overall funding available for programs in the year 2000 gives state, regional and local agencies a window during which they can concentrate on getting their data collection and performance measurement applications on-line. Undoubtedly, a substantial clearinghouse role is to be played by Caltrans by collecting and disseminating practical know-how and other resources to facilitate this process.

Funding levels will rise again during the 2002 programming cycle as a result of new infusions of money from Federal legislation. By that time it is expected that TIP submittals local project planning, and internal quality management will all incorporate performance measures in some way.

Technology is rapidly developing in the meantime. It is anticipated that this development will significantly enhance the collection of data, particularly as global satellite positioning equipment becomes more available and the integration with geographic information systems becomes more seamless. At the same time as storage and processing technologies improve, the ability to manage and analyze data will be easier in both large and small jurisdictions.

Given the user focus being initiated along with performance measures, it is encouraging that better integration is anticipated between performance measures and real time information systems and alternative transportation facilities like high occupancy toll (HOT) lanes. These can be expected to generate more and better user feedback while simultaneously expanding user choice.

Of course the emphasis on buy-in applies to technology as well. Even where the technical aspects of new transportation alternatives and new performance measurement applications seem sound enough to professionals, user input will still be a key to success.



## Suggestions for Further Reading

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